PUTTI: AN ART CRAWL IN A POST-HUMAN WORLD

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Concept

Terabytes of paintings; no humans left to interpret them...

In the future, all that remains of humans are their data (stored away in vast archives) and their algorithms (which crawl the archives, trying to interpret the data).The National Gallery of Art is now home to billions of fledgling algorithms, who feed on the data it provides.

"Semantic rot" of digital art archives over time...

But the interpreted spaces the algorithms navigate bear little resemblance to human interpretations. Without humans to interpret these vast archives, has the art lost its meaning? Has it acquired new meanings?

An intrepid explorer...

In this experience, you explore as one of these algorithms. You traverse multiple eras of human art, trying to make sense of these treasured cultural artifacts.

Method

Depth map prediction from single paintings

To predict three-dimensional depth maps from monocular RGB images of famous paintings: Monodepth (a convolutional neural network [1], trained on the Cityscapes dataset [2]).

Semantic segmentation of paintings

We tried using DeepScene [3] (trained on the Cityscapes dataset, as above) to semantically segment paintings, in order to bolster the appearance of depth with object rendering orderings based on an algorithm/crawler's X-Y position on the depth map. However, the results were poor enough that we decided not to incorporate semantic segmentation into our final piece.

Automatic generation of verbal painting descriptions

To automatically infer descriptions for paintings: NeuralTalk2 [4] (convolutional neural network followed by a recurrent neural network, trained on the COCO dataset).

Style transfer

Character as content image, painting as style image ⯈ your character attempts to emulate the style of each painting, while traveling through multiple eras of human art, using DeepArt.io [5].

Related Work

(a) Mackenzie Cauley manually re-created a painting by Van Gogh (Night Cafe) as an explorable environment in VR, while exploring how best to faithfully capture Van Gogh's painterly approach in 3d space [6].

(b) The ARART project brings certain well-known paintings alive (when viewed with a phone camera through the ARART mobile app), by overlaying them with (manually) pre-created animations [8].

(c) In the hit 90s children's television series Blue's Clues [7], the protagonist, Blue, often jumps (or "skidoo's") into paintings; entering an explorable, interactive 3d world.

Results

Approach

To create this game, we employ a combination of various machine learning methods (see **Methods**) to:

(a) try to infer **3d structure** underlying each painting (i.e., inferring a depth map);

(b) try to infer **descriptions** of what each painting (literally) depicts; and

(c) try to infer (and emulate) each painting's abstract "**style**"

We then use the inferred depth map to provide the terrain upon which you and your fellow algorithms crawl (within each painting). You can travel forward in time using doors within each painting that lead to a painting from the next era. We use style transfer to allow you to assume each painting's style. The inferred descriptions represent your best guess at the painting's meaning.

References

[1] https://github.com/mrharicot/monodepth
[2] https://www.cityscapes-dataset.com/
[3] http://deepscene.cs.uni-freiburg.de/
[4] https://github.com/karpathy/neuraltalk2
[5] https://deepart.io/
[6]https://www.newscientist.com/article/dn27545-step-into-this-van-gogh-painting-recreated-with-virtual-reality/
[7] https://en.wikipedia.org/wiki/Blue%27s_Clues
[8] http://www.arart.info/